The student's experience of teacher support in French vocational high-school classes with difficulties in school engagement in physical education: interest of mixed methods research

Amélina Girard, Nathalie Gal-Petitfaux, Olivier Vors

Girard, A., Gal-Petitfaux, N., & Vors, O. (2021). The student's experience of teacher support in French vocational high-school classes with difficulties in school engagement in physical education : Interest of mixed methods research. *Physical Education and Sport Pedagogy*, *0*(0), 1-16. doi: 10.1080/17408989.2021.1999918.

The student's experience of teacher support in French vocational high-school classes with difficulties in school engagement in physical education: interest of mixed methods research

Abstract

Introduction: This article aims to show the contribution of mixed methods research (Creswell 2015; Smith and McGannon 2018) to a study conducted within the Course-of-Action Research Programme (Theureau 2006, 2015). It analyses the experience of French vocational high-school students in physical education over a school year to identify and understand the social support of the teacher in engaging the students. This enabled us to describe and understand the typical supports experienced by students to engage with the work.

Methods: To do this, we completed the Course-of-Action observatory with the CASS-S questionnaire (Malecki and Elliott 1999) to study the most significant experiences of support for students in the classroom during three teaching sequences of the year. Ten vocational high school classes with difficulties in engaging in school work were monitored during three teaching sequences. The teachers monitored were experts in teaching in vocational schools and had the characteristic of being highly invested in supporting the success of students with task engagement difficulties. The collection and processing of heterogeneous data (qualitative and quantitative). The first stage consisted of quantitative data collection using the CASS-S questionnaire in order to identify the teacher's social support as perceived by the students. The second stage consisted of conducting self-confrontation interviews enriched with the questionnaire with students who had a high perception of their teacher's support in order to understand their engagement in class. The data was processed in two stages: statistical analysis of the scores obtained in the questionnaires and analysis of the students' verbatims by typification of the components of the experience.

Results: The quantitative results showed a global perception of frequent and important class-wide teacher social support via the CASS-S questionnaire. Furthermore, a more in-depth analysis shows variations over the year. This overall analysis is complemented by qualitative findings that provide insight into the significance that students attach to teacher support in their engagement with school tasks. The analysis of students' experience shows different kinds of typical-support paired with: the valorisation of students' progress, the students' concerns, the game action of the teacher, and teacher knowledge, promoting their engagement.

Keywords: Mixed methods research, experience, perceived and experienced teacher social support, vocational high-school students, physical education.

Introduction

In France, the pupil in a vocational high-school is engaged in both general and vocational training (Education Code, Articles D333-7 and L337-1). 60% of students enrolled in these school contexts have not chosen the vocational stream to which they are assigned as their first choice. This non-choice (Bernard and Troger 2012), indicative of a bumpy school path (Jellab 2017), is becoming the primary cause of school dropout and deviant behaviour (Arrighi and Gasquet 2010). These students, who have major academic and social difficulties, then show a lack of trust in school institutions and do not find meaning in the teaching provided, which puts the teacher in a difficult teaching context.

Thus, the engagement of students in schoolwork becomes an important professional issue and the teacher-student relationship, based on social support from teachers, is identified as an important lever for this involvement (Jellab 2016). The teacher's social support is a relationship based on teacher empathy and benevolence. It is characterised by clear explanations, help, advice and guidance to achieve academic goals as well as the student's emotional support to structure the interactions between teacher and student (Pianta, Hamre, and Allen 2012). According to Tardy's model (1985), social support is broken down into four components: emotional support (expression of trust and benevolence), informational support (provision of advice and additional information), appraisal support (provision of positive feedback) and instrumental support (technical assistance, especially material assistance). Each type of support refers to a type of teacher behaviour that influences student activity (Tennant et al. 2015) and their motivation to engage in school work (Wentzel 1998). Wang and Eccles (2012) have studied the influence of teacher social support on three dimensions of engagement (behavioural, emotional and cognitive engagement) of 1,479 students between middle and high school. They show teacher support is particularly important in reducing the risk of dropping out during secondary school. In fact, teacher support is considered as a

predictor of student engagement (Roorda et al. 2011; Wang and Eccles 2012), in particular in difficult teaching contexts (Tennant et al. 2015; Wentzel et al 2010) and in physical education (Lubans, Morgan, and McCormack 2011). The students' perception of teacher support (Roorda et al. 2011) is then an important motivating factor for students to act (Cox and Williams 2008; Wentzel et al. 2017). It allows for a reduction in conflicts, an improvement in the students' commitment and academic results (Ladd and Burgess 2001).

The majority of research on teacher social support focuses on elementary or middle school students (Poulou 2017; Rueger, Malecki, and Demaray 2010; Tennant et al. 2015; Wang and Eccles 2012; Wentzel et al 2010). And to our knowledge, no research has studied teacher social support in vocational high schools which are considered difficult, in order to understand what it is about their activity that enables them to be more engaged. These studies use self-reported questionnaire measures of students' perception of teacher social support. These data are most often correlated with other variables such as gender, ethnicity (Wang and Eccles 2012) or motivational goals (Cox and Williams 2008; Stanger et al. 2018; Wentzel et al. 2017). These various studies on the perception of support invite us to extend them with studies in classroom ecological situations as advocated by Stanger et al. (2018) in order to access the meanings given by students to their teacher's support. For example, Suldo et al. (2009) investigated teacher social support using a mixed method to identify each type of teacher support behaviour perceived by students in the classroom during the lesson. According to grounded theory methodology (Corbin and Strauss 1990) these authors conducted interviews with groups of students' with a high level of teacher social support perception related on quantitative data, to identify with them their teacher's supportive behaviour. Then they show that it is difficult to categorise teacher support behaviour into a single type of support as these are so multifaceted. However, their study shows twelve categories of teacher support behaviour in the classroom such as the teacher "Conveys interest

in student wellness", "Gives students what they want, specifically things that are pleasurable", "Is sensitive and responsive to the entire class's understanding of academic material", "Treats students similarly", etc. These results show the interest of mixed methods research in understanding the student's perception of teacher social support quantitative data (measuring the perception of social support via CASS-S questionnaire) and qualitative data (understanding the teacher's activity in the classroom) in a classroom ecological situation. Nevertheless, the theoretical framework used in this mixed method does not provide access to the meanings given to the support from the point of view of the students' lived experience.

Some Mixed Methods Research seems to be able to give us access to the meanings given by the student to the support they receive from their physical education teacher and the effects of their engagement in school tasks. Mixed methods are defined as 'the design of mixed methods such as those which include at least one quantitative and one qualitative method, where neither type of method is intrinsically linked to a particular paradigm' (Greene, Caracelli, and Graham 1989). The use of different methods aims to shed light on the research hypotheses by articulating and crossing heterogeneous data (qualitative and quantitative) (Creswell and Plano Clark, 2018). Green et al. (1989) put forward several functions to the mixed methods: triangulation (convergence, corroboration, correspondence of results from the different methods), complementarity (elaboration, enhancement, illustration, clarification of the results from one method with the results from the other method), development (use the results from one method to help develop or inform the other method), initiation (the discovery of paradox and contradiction, new perspectives of frameworks, the recasting of questions or results from one method with questions or results from the other method) and expansion (extend the breadth and range of inquiry by using different methods for different inquiry components). Teddlie and Tashakkhori (2009) propose a classification of the usefulness of mixed methods into five categories: Parallel Mixed Designs, Sequential

Mixed Designs, Conversion Mixed Designs, Multilevel Mixed Designs, Fully Integrated Mixed Designs. This classification highlights different levels of articulation and the complementarity of methods: from the use of quantitative and qualitative methods in parallel at the same time (Parallel Mixed Designs), to a permanent interaction of quantitative and qualitative methods at each level of the research (Fully Integrated Mixed Designs). In order to access the experience lived by students when they receive support from their teacher, the use of Mixed Methods enables us to consider triangulation and complementarity of the data collected at different levels of our study.

Our mixed method was based on the Course-of-Action Research Program in Enactive Phenomenology (Theureau, 2015) that was enriched by the questionnaire tool to understand the meanings attributed to the PE teacher's support by vocational high school students who are resistant to engaging in school work. This research programme draws its theoretical and epistemological foundations from the theory of action and situated cognition (Suchman 1987) and from the theories of enaction and bodily inscription of the mind (Varela, Thompson, and Rosch 2017). The Course-of-Action Research Program defines the actor/environment coupling as situated (inherited from situated action, Suchman, 1987) and defends the principle of the action accompanied by meanings for the actor according to which all action is accompanied by meanings for the actor (inherited from phenomenology (Merleau-Ponty 1945; Sartre 1960). This theoretical framework provides access, under strict methodological conditions, to the lived experience of teacher student support by their PE teacher, that is to say their pre-reflective consciousness in the situation.

So, by taking into account the material and social environment of the individual's activity, the Course-of-Action Research Program makes it possible to apprehend the lived experience of students in teacher support situations: analysis of individual-social activity (Theureau 2006). Considering the individual-social activity of the student in class means taking into account the

way in which the teacher's actions makes sense to them, in particular the support they provide during the lesson. Nevertheless, this theoretical and methodological framework cannot study activity at the collective level of the class, going beyond the level of the individual activity of an isolated student, such as the classroom. The theoretical objects of the Course-of-Action program have, so far, enabled the individual-social activity of small groups of individuals to be studied such as the study of nine basketball players (Bourbousson et al. 2011). Thus, in order to be able to study the meanings given to the support of the teacher at the class level an operative reduction of the Course of action observatory is useful.

Our mixed method was operationalised through the use of the questionnaire tool in data collection. We used the CASS-S Questionnaire at different steps in our study. The CASS-S questionnaire tool was used to analyse, at a collective level, the students' perception of the teacher's social support. Then, this questionnaire was used at an individual level, during the self-confrontation interviews to help verbalise the students' experience of support. Child and Adolescent Social Support Scale Questionnaire (CASS-S) measures the appreciation by students of four types of social support received (Tardy, 1985) from a global network (teacher, parents, peers) (Malecki and Elliott 1999), inspired by the Mixed Method Research (Greene, Caracelli, and Graham 1989; Teddlie and Tashakkori 2009). Various studies in sport carried out in this framework have shown the fertility advantage of combining heterogeneous data (crossing experiential with biomechanical or kinetic or physiological data) (Rochat et al. 2018). Here we are interested in heterogeneous data that enable us to better understand students' lived experience of teacher support.

In our study, the use of a mixed method aims to describe and understand, at a collective and individual level, the general and experiential views of students and the meanings they attach to their teacher's social support. Thus, we have identified the typical supportive moments experienced by students that enable them to engage in class work. Thus, our theoretical

anchoring in the mixed method addresses three issues; the articulation of heterogeneous data at each level of the research: multilevel mixed method (Teddlie and Tashakkori 2009) ; and the complementarity of quantitative and qualitative data (Greene, Caracelli, and Graham 1989). The benefits of our methodological tools from the Course-of-Action Research Program will be illustrated through the presentation of some emblematic results of our study on the meanings students of vocational high schools give to the teachers' support activity at different levels: (1) collective (the class) and (2) individual (the student's activity).

So to show the contribution of our mixed method to research in physical education teaching, we will detail each step of our method and we will illustrate it with some of the results obtained.

Materials and methods

Participants

The study was conducted from 2018 to 2020 in two French vocational high schools, in 10 industrial and tertiary sector classes. The students had a high rate of absenteeism, academic and social difficulties and significant problems of engagement in schoolwork. Each class had two hours of Physical Education per week. Students were aged 14 to 17 (18.5% girls; mean age [M] = 16.23, standard deviation [SD] = 0.87). The average age of the students studied is explained by the delay accumulated during schooling (repeated years, guidance failure) when they were oriented to tertiary-sector and industrial streams.

The 10 PE teachers had more than 5 years' experience of teaching in vocational schools. They were familiar with the problems of these students and were committed to helping the students enjoy practising and investing in PE. The four teachers in the case study were very involved in the schooling of their class by being the class's main teacher and had a great deal of experience in supporting students in their school career.

The school year was divided into three teaching sequences: P1 (September-October); P2 (November-January); P3 (February-May) in connection with three work experience teaching sequences.

Data collection

Our mixed methods study consisted of two steps. The first step consisted of collecting experience data, processed quantitatively via the CASS-S questionnaire (N quantitative=245), in order to (1) identify and understand how frequent teacher social support in vocational high school classes was at each period of the year and the perceived importance of it; (2) identify students with teacher support perceived as very frequent and/or very important. In a second step, the four classes with the strongest perception of teacher support were studied qualitatively. In these classes, two students with high scores or significant positive variation in perceived teacher support were selected for self-confrontation interviews after each test (N qualitative=24). These selected students were interviewed at the end of the three periods after completing the questionnaire (72 self-confrontation interviews). The collection of experiential data of a qualitative nature characterises how the student experienced teacher's support to act or engage in the classroom at each period of the year. For each of these stages, we will give the objective of the stage, the method, and the processing of the data.

Step 1 - Analysis of Teacher Social Support using child and adolescent social support scale *(CASS-S; (Malecki and Elliott 1999)*

Step objective

This descriptive step was carried out with 10 classes. The goals were to give a global vision about teacher social support in "difficult" classes. Thus, we identified and characterised the perception of teacher support by students in three different PE teaching sequences during a school year. Also, in order to characterise more precisely the students' global perception of

support, we analysed the variations in support between two teaching sequences. Then, the goal was to identify groups of students who have a high perceived support frequency and/or importance score or a significant variation in scores between two sequences in order to carry out an in-depth qualitative analysis (Step 2).

Data collection via the CASS-S questionnaire

The data collection for this study was carried out through the CASS-S questionnaire (Malecki and Elliott 1999). It represents a methodological device used for the first time in the context of Course-of-Action research in order to gain access to experience over a longer period of time (one year) and for a large number of students (245). This CASS-S questionnaire measures, via two Likert scales (from 'Never' to 'Always', and from 'Not important' to 'Very important'), the frequency and importance of the perception of the teacher's social support by students on 12 items assessing each of the four components of social support: emotional support, informational support, appraisal support, instrumental support, with reference to Tardy's Social Support model (1985). This tool, borrowed from social psychology, aims to assess the perception of social support from the teacher, peers and family. In our study, this CASS-S questionnaire is used to report on students' past experience of teacher support during the physical education lesson that had taken place shortly before. We then contextualised the use of the questionnaire when it was given to the students: 'You have to fill in the questionnaire according to what you have just experienced in this lesson with teacher X'. The questionnaire was filled in by all the students in the 10 classes followed (N=245) at the end of the 3rd lesson out of 7 during three teaching sequences (Three different sports teaching). The third lesson was chosen because it was in the middle of the teaching sequence and was not concerned with an assessment of students' learning. In order to place the students in good conditions for data collection, they were spaced apart from one another, the researcher stayed close to them to help them understand certain items and the teacher

remained at a distance from the students. After the three rounds, only 65 students out of the initial 245 had completed the questionnaire on all three occasions; these defections are typical for the public studied (frequent absenteeism).

Processing of data from the CASS-S questionnaire

The data collected by questionnaire were processed as follows: (1) calculation of the scores obtained for each questionnaire for perceived support measured during a teaching sequence by students of 10 classes in order to identify the perception of support from their PE teacher; (2) statistical analysis using repeated measures ANOVA tests to characterise variations in students' perceived teacher social support across teaching sequences; (3) selection for the qualitative analysis of students who scored high or a significant variation in score between two sequences on the overall score of their perception of their teacher's social support.

Step 2 –Comprehensive analysis by means of self-confrontation interviews enriched with the CASS-S questionnaire

Step objective

The objective of Step 2 was to understand for each 'high score' student what they experienced in the form of typical-support that helped them engage in the work. Typical support corresponds to an action that is experienced as significant for the student in the situation. This typical support is considered typical when it corresponds to four aspects (Durand, 2014): descriptive (i.e., the typical occurrence presents the highest number of traits of the experience analyzed in the sample of participants and the situations studied); statistical (i.e., the typical occurrence is the one most frequently observed in the sample studied); generative (i.e., the typical occurrence has a propensity to recur when conditions resembling those observed are reproduced), and significant (i.e., actors express a feeling of typicality

when they are questioned about it during enactive interview). Thus, we seek to understand how the teacher's support activity was experienced by the students and how this lived support organised their involvement in the work requested by the teacher.

Data collection via enriched self-confrontation interviewing

Of the 10 classes in step 1, we choose the classes with the highest score in teacher social support. Four classes were monitored for this step. All four classes were emblematic of teacher support that was perceived to be frequent and important for students in step 1. The results presented here are intended to illustrate the case study in order to understand the method used. We use extracts of verbatim or discussions in class to illustrate the lived experience.

Data collection consisted initially in filming each physical education lesson for which the CASS-S questionnaire was filled in (Step 1) in each teaching sequence TS1 (acrosport), TS2 (Ultimate & Tennis table) and TS3 (Badminton), by all the students in both classes, i.e., six two-hour lessons (24 hours of footage). Following the recording of each lesson, two students having "high scores" or a significant variation between two sequences per class were invited to participate in an enriched self-confrontation interview in each period, in order to carry out an analysis of their experience of receiving support from their teacher (72 individual interviews in total). These interviews were initially conducted according to the course-of-action approach: confronted with the recording, students were invited to show, mime, simulate, tell and comment on their activity. In this way, they explained their lived experience of the teacher's support activity, including their concerns, perceptions and knowledge in the moment being studied (Theureau 2010b). In order to go further, the researcher used CASS-S questionnaire items previously filled in by the students, without making their answers and scores visible to them. Only the items filled in by the student were presented during the interview in the form of schematic vignettes on a sheet of A4 paper.

The purpose of the 12-item self-comparison interview instrument was to help the student to better explain and qualify the moment of support he/she was talking about, and thus enable the researcher to refine his questioning in order to access more precise meanings for the student about the support. For example, the researcher asked the student: "You just told me that the fact that the teacher challenges you makes you want to do more. Can you tell me in which vignettes you would put what the teacher is doing?". From then on, when the experience explained by the student referred to the teacher's support activity, the researcher presented these items of the questionnaire to the student, inviting him or her to select an 'item' vignette that corresponded most closely to what they had just said. Depending on the position of the perception of the teacher's support by the student on the Likert scale (Step 1) for the chosen item, the researcher would then use this as a tool for further questioning in order to validate the student's statement or to create controversy in the event that a significant difference appeared between the initial response to the questionnaire and what he/she was explaining during the interview. In the case of a significant discrepancy between the item chosen and the answer given on the questionnaire, the researcher was able to question the student about this dissonance in order to deepen the explanation of his/her lived experience of the support received from the teacher. The following excerpt ***[Table 1]*** gives an example of an enriched self-confrontation interview in which the researcher uses a vignette to invite the student to refine his/her explanation of his/her experience of teacher support.

Table 1. Example of enriched self-confrontation interview: Marius "High' (3rd, lesson 3 badminton)

[Researcher]: What's going on there?
[Marius]: Well, we were actually playing against a team and I sent it back a little too short, and Thomas sent it back. So I went to ask him [the teacher] if we were allowed to do that, I basically did a pass to him.
[Researcher]: And Is the teacher telling you?
[Marius]: He is telling me that it's not good, that you're not allowed to make passes.
[Researcher]: What does it do to you?
[Marius]: It's good because you are listened to and you get an answer when he could have kept on playing (with Faustina). (The teacher was busy doing a demonstration with another group of

students).
[Researcher]: How does it feel for you at that moment?
[Marius]: Good, because he answers us directly, because right now he's talking with a student, he was going to play but he waited for me to ask him my question and answer it.
[Researcher]: In which vignette (visual representation, on a sheet of paper, of the questionnaire items from study 2) would you put what you told me?
Marius]: Yeah. [Marius]: Yeah. This one (Marius chooses as a vignette: "agree to be asked questions")
[Researcher]: How do you feel at that moment?
[Marius]: Good
[Researcher]: How well?
[Marius]: Good because he answers us directly, because right now he's talking with a student, he was going to play but he waited for me to ask him my question and answer it.
[Researcher]: Is it important for you that he answers you well?
[Marius]: Yes, it gives us confidence, because if you have a teacher who doesn't listen to you, who just does his job...well, you're not going to like him very much

Identification of components of Marius' lived experience of teacher support

Actions and communications in the lesson	Concern	Perceptions	Knowledge
Marius goes to see the teacher to ask him a question about the rules of the doubles game.	Wants to know if he is allowed to pass to his doubles partner.	See that the teacher stops demonstrating to answer his question while he was playing with Faustine.	Knows that he can ask the teacher a question without the teacher "blowing him off".

This excerpt illustrates, among the 72 enriched interviews conducted, the use of the questionnaire by the researcher to get the student to both specify and summarise in one sentence his or her lived experience. After selecting the item that speaks most to him, the student evokes the emotional support provided by the teacher.

Processing of data from enriched self-confrontation interviews

The processing of audiovisual data and self-confrontation interviews was carried out in four steps (Theureau 2010a). The first consisted in describing the actions and communications of the filmed students, then transcribing the interviews. The second step consisted of constructing a two-part table showing the temporal correspondence between the actions and communications during the lesson and the interview transcript. The third step consisted in documenting the significant components of the students' experience: their concerns at a given Time T, i.e., the commitment that guided their activity; the perceptions

that guided their action at the same moment – auditory, visual, mnemonic, emotional; and the knowledge that they mobilised or constructed in action, at that Time T. Finally, the fourth step sought to analyse the typical experiences of the students in order to identify, on the basis of the components that had been informed (concern, perception, knowledge), the typical meanings that the students gave to the support of their teacher. These typical meanings made it possible to characterise typical moments of teacher support that the students perceived at each period, and during these periods this support enabled them to engage in the task requested.

Results

The results obtained through our mixed method research enable us to understand how students perceive and experience teacher support in order to engage in their work. Firstly, the analysis of quantitative data enabled us to gain an overall view by specifying the frequency of support perceived by the students in class and the importance they attach to it. Secondly, the analysis of the qualitative data gave us a comprehensive view of the teacher's support experienced by the students, making sense of their engagement in the school task in PE.

Step 1 – *A perception of the frequency and importance of class-wide teacher social support via the CASS-S questionnaire (Malecki, Demaray, Elliott, & Nolten, 1999)*

The quantitative results give us an overall picture of the students' perception of support. The overall results for the 10 classes show that the students surveyed perceive their teacher's support to be very frequent and important throughout the year. More specific results over three teaching sequences showed that the perception of teacher support varied over the year, although the average scores remained stable from one sequence to the next.
Teacher support was perceived as highly frequent and important in the 10 classes studied throughout the year.

Teacher support perceived frequency et importance during the year

The average scores of the CASS-S questionnaire obtained by the students in the 10 classes showed a high perception of support from their teacher throughout the year. Indeed, students reported perceiving support from their teacher "almost always" to "always" (50.8/72). This support was perceived by the students as "important" or "very important" (27.5/36) ***[Table 2].***

Table 2. Average scores for each test in the 10 classes studied

	Teaching sequence 1	Teaching sequence 2	Teaching sequence 3	Mean
Frequency /72	44.9	51.9	55.7	50.8
Importance /36	25	24,5	33	27.5

These results confirm a strong perception of support. In other words, students report that their teacher is supportive.

Teacher support perceived fluctuates between different teaching sequences

Although the mean scores obtained in each CASS-S questionnaire were relatively stable between different teaching sequences, the statistical analysis of variance shows a significant variation in the perception of support over the year ($F(1, 65) = 30.267$, $p < .001$). This significant variation in the perception of support indicates that teacher support makes sense in different ways to students depending on the sequence in which it is provided. The Bonferroni test showed, in fact, that students' perceived support was more frequent in the third teacher sequence ***[Figure 1]***. The importance of students' perceived support decreased slightly in the

second learning sequence and increased again in the third sequence ***[Figure 2]***.

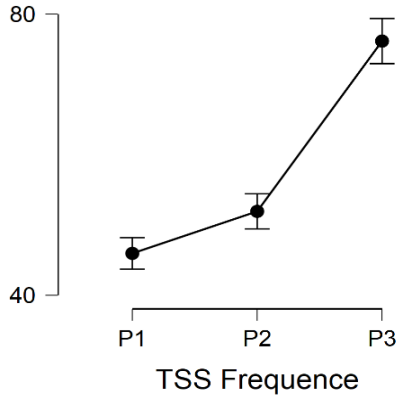

Figure 1. Plots description of Variation in the frequency of perceived teacher social support (TSS) over the three teaching sequences

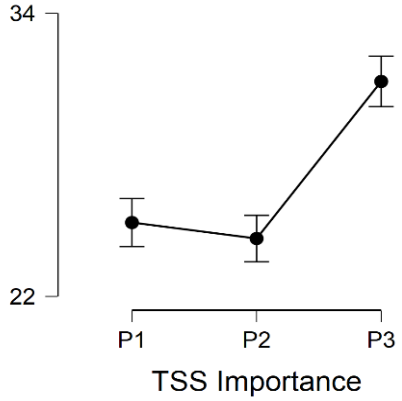

Figure 2. Plots description of Variation in the importance of perceived teacher social support (TSS) over the three teaching sequences

Further analysis of the categories of self-reported support (emotional, informational, apraisal and instrumental) shows a significant variation in apraisal support while the others remain stable (p>0.05***) [Table 3].*** Indeed, depending on the teaching sequence, the ANOVA test showed that apraisal support (positive feedback on their work) varied significantly over the year in frequency ($F(1, 65) = 191.545$, $p < .001$); and in importance ($F(1, 65) = 255.424$, $p < .001$). Indeed, the Bonferroni test results show that the frequency of apraisal support increases sharply between the first and second teaching sequences (pbonf < .001) and then stabilises in the third sequence (Figure 3). While the importance of this same support is relatively stable

between the first two teaching sequences (pbonf = 1) and increases during the third sequence (pbonf < .001) ***[Figure 4]***. The meanings of the support perceived by the students thus seem to change from one sequence to the next.

Table 3. ANOVA Test of the variance of each type of support

Type of support	Emotional Support	Informational Support	Apraisal Support	Instrumental Support
Frequency	0.847	0.607	<0.001	0.915
Importance	0.322	0.374	<0.001	0.986

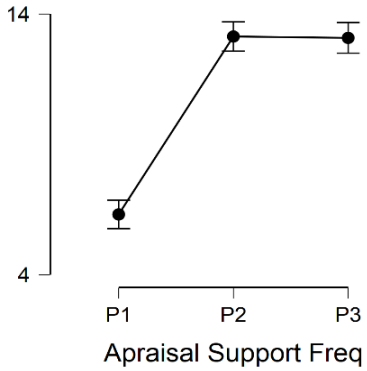

Figure 3. Plots description of Variation of the apraisal frequency support perceived during the three teaching sequences

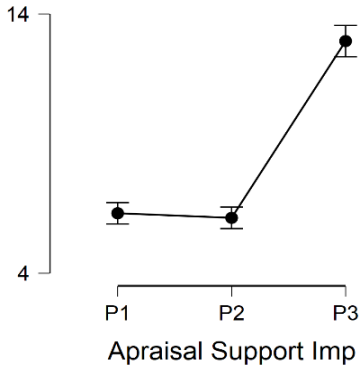

Figure 4. Plots description of Variation in the importance of perceived support over the three teaching sequences

This quantitative overview gives a global view of the support perceived by the students, and also shows some variability between the three periods. Beyond this snapshot, we thought it

would be interesting to carry out a complementary qualitative analysis to understand how this perceived support helps them to engage in the school work required.

In order to refine the understanding of the meanings given to the teacher's social support during the teaching sequences, we chose, by calculating the differences in score between two teaching sequences, to identify the differences in perception of the teacher's support between students who have a high score of perception of the teacher's social support and those whose perception of support increases ("high score").

Step 2 –Teacher support experienced by students in class changes their engagement in school work via enriched self-confrontation interviews

The analysis of the enriched self-confrontation interviews conducted with the students in the four classes selected at the end of stage 1 reveals that the meaning students give to the teacher's support modifies their engagement in school work.

The analysis of the lived experience of the 24 students interviewed shows that the perception of typical support is coupled with the teacher's valuing of students, students' concerns, the teacher's play actions and a repertoire of knowledge about the teacher's activity.

Typical support coupled with teacher recognition that progress is being made to encourage engagement with work

One of the typical forms of support experienced by the student is coupled with the teacher's appreciation of the progress made by the student. This corresponds to moments when the teacher congratulates the student, encourages him/her to do better, and gives him/her advice on how to progress. This typical support can be illustrated by a few interventions by the teacher that stand out for the students during the various interviews: "That's good", "You've understood", "You see, you're making progress, you weren't able to do that before...", "Congratulations, that's what I want to see". These few examples illustrate the recurrence of this type of intervention described by the students in similar situations of

support from their teacher. For example, Marius (AC_Marius-S3BAD), tells us that when the teacher came by and said about his practice "that's it, he finally understood that he shouldn't shoot hard" when Marius succeeded in making a counter-match in badminton, that this intervention generated positive emotions in the student: "it's nice"; "it's cool, it's nice". Through these actions, the students have the impression that the teacher "cares about the students" and that "we gain confidence", "it makes us want to continue more and more". This experience of support, coupled with a recognition of progress, was typical for all the students studied.

Typical support coupled with student concerns in action to encourage engagement at work

The teacher's actions are experienced by the students as supportive when they correspond to the teacher's own concerns. When the student experiences this type of support from the teacher, it motivates him/her to engage in the expected work.

In other words, from the student's point of view, when the teacher intervenes by responding to the student's concerns, the student feels supported and changes his or her engagement in the situation. For example, the student is particularly sensitive to the teacher's advice in ultimate when she perceives that she is in difficulty in the situation. Her concern is to try to make a straight pass with the Frisbee. Faustine (AC_Faustine_S3Ultimate), expresses that she cannot make straight passes to her partner and that in addition to her difficulties the cold does not motivate her too much. She said during the self-confrontation interview: "I can't do it, but the teacher takes the time to show us". She perceived the teacher's actions to help her with her concern, such as the demonstration, the advice on how to hold and throw the Frisbee, as an important support. This got her back into the activity since she had started to give up in the face of her repeated failures. The originality of this support/concern pairing is particularly important, as it depends on the experience of the students. The same word or demonstration

may be experienced differently depending on the concerns of the students. In this example in Ultimate, some students did not experience the demonstration as support because they were able to pass the ball. On the contrary, they had a negative experience of wasting time, their preoccupation being with the game. In the same way, a support evaluated as very frequent when completing the questionnaire, does not seem to presage a support experienced as meaningful for the student. For example, William (AC_William-S3Table Tennis) self-reported his perception of the frequency of informational support as "always". From the analysis of his experience, it can be understood that he negatively perceives the large number of instructions. These interventions by the teacher are out of step with his own concerns. William's preoccupation at that moment was to practice: "It's long because I already know it, I want to play". The teacher's activity perceived and described as a support by the student is experienced as a brake on his desire to practice at that moment. This example shows a dissonance between the "perceived support" questionnaire and the "experienced support" of the student in the situation and confirms that the support experienced by the students is dependent on their concerns in the action.

Typical support coupled with teacher's play actions promoting engagement in work

The students experience some of the teacher's playful actions as a strong sign of support. What is supportive from the students' point of view is when the teacher plays with them. On the one hand, the teacher plays, in the literal sense of the word, when he or she plays sports with them. This is the case of teacher X who plays badminton with the students. The students who have played with him feel a strong support from the teacher. They say "the teacher is cool, he plays with us, ..., it's nice, it shows that he likes us, that he is accessible". On the other hand, the play actions also correspond to humour. It is when the teacher laughs with the students, when they tease them. These games from the teacher to the students are perceived as a support that makes them engage in the prescribed work.

For example, Timo (3rd Career Preparation, TS3, Badminton) at the beginning of the badminton lesson, says in the interview that "[he] stayed as long as possible in the changing room so as not to have to put up the (badminton) nets". When he arrives in the gym, the teacher calls out to him and says "You have to help Timo" in a mocking tone of voice. Timo then says that the teacher's intervention is based on humour: "he (the teacher) makes me laugh when he says "You have to help Timo", which basically means "move" with his funny accent". This intervention is experienced as a support, because the teacher laughs with him, it makes him want to do what is asked. His preoccupation with avoiding helping to put up the nets was then modified and Timo said "Finally I went to put up the nets".

This example, among others, shows that the meanings given by the students to the teacher's support depend on the teacher's intervention during the lesson which creates new concerns for the students.

Finally, the analysis of the activity shows that the moments when the student experiences support vary from one teaching sequence to another but also within the lesson itself. The teacher's support helps the student to engage in the school task because it allows him to actualise task-oriented concerns. The teacher's support also allows the student to change non-task-oriented preoccupations, e.g. "not practising because it's cold", "dodging assembling materials", "playing with friends", to re-engage with the work.

Typical support coupled with a repertoire of knowledge about the teacher's activity to engage them in the work

The analysis of the components of the students' experience showed that the support perceived by the students was accompanied by the construction of a repertoire of detailed knowledge about the teacher. Indeed, the moments identified by the students as moments of support for their engagement in school work by the teacher are accompanied by a repertoire of knowledge built up about the teacher in the course of action or during past actions. This

knowledge, which is significant of the teacher's support, can be categorised into different types of knowledge: knowledge about the teacher's physical presence; knowledge about the teacher's physical expressions/attitudes (smiles, hand signals); knowledge about the respect shown to them by the teacher: "he listens to us", "he speaks to us well", "he says please, thank you when he asks us for something", "he doesn't ground us directly"; knowledge about the humour with which the teacher addresses them: "Knowledge about the emotional state that the teacher communicates to them: "when the teacher doesn't smile during the instructions, it means that he is serious, that we have to listen so that we succeed". This knowledge gleaned about the teacher's activity shows how the teacher's social support activity makes sense for the students during their interactions in class. Students categorise as support those moments when the teacher pays attention to them and is available to them, they describe their teacher as a 'cool teacher'.

The analysis of the students' activity shows that this knowledge mobilised in the action is updated because it is constructed during past experiences with their teacher. Indeed, events prior to the lesson enabled this knowledge on the teacher's support activity to be built. For example, Ousmane explains that the teacher, when he passes by them in the playground, makes remarks about the fact that they should not smoke and "it shows that he pays attention to us". Or the teacher's intervention in a previous lesson to help them progress in practice enabled the students to build knowledge "the teacher wants us to succeed, he takes the time to show us". Marius refers to the acrosport lesson where the teacher relied on a group of students to explain to him what he had to do to succeed. This qualitative analysis therefore shows that the students experience various typical supports in class that modify their commitment to the school task: desire to invest more, desire to show that they can do things. These typical supports are coupled with the student's preoccupation with action and the knowledge built up about the teacher.

In conclusion, the quantitative results are that overall the CASS-S questionnaire shows that students perceive frequent and important class-wide teacher social support. Furthermore, a more in-depth analysis shows variations over the year. This overall analysis is complemented by qualitative results to understand the meaning that students attach to teacher support. The analysis of students' experiences shows that students experience teacher support as an aid to engagement in school work if this support is coupled with their affects, concerns, and knowledge about the teacher.

Discussion

The discussion will address two points: (1) the contribution of mixed methods research to the Course-of-Action Research Programme by means of an articulation of heterogeneous data respecting the primacy of the intrinsic, and (2) the enriched self-confrontation interview as a methodological device to help students' verbalisation.

The contribution of mixed-methods research to the Course-of-Action Research Programme through an articulation of heterogeneous data while respecting the primacy of the intrinsic

The introduction of mixed-methods research in our study sought to respect throughout the analysis the presupposition of the primacy of the intrinsic nature of the Course-of-Action Research Programme, in order to account for the teacher support perceived by the students. Our first qualitative study, having identified social support as a structuring dimension of the commitment of these vocational high-school students, led to the study presented here, employing mixed methods (quantitative then qualitative) in order to shed light on the permanence of this support, from the students' point of view, over the course of a year. This generative methodology derived from neurophenomenology (Varela 1996) and cardiophenomenology (Depraz, Gyemant, and Desmidt 2017) attributes primacy to the intrinsic, in the sense that experience data are temporally primary. Experimental data are used

to identify and sample relevant elements to be studied with other methodologies (Rochat, Hauw, and Seifert 2019). We cross-matched our CASS-S questionnaire and self-comparison interview methods at several levels of our study: (a) at the level of Step 1, to describe the perception of support during the year by students, (b) at the level of the enriched self-comparison interview, to enhance the explicitation of the student's experience of support, to understand the meaning they give to the support experienced in the classroom. The combined use of a questionnaire derived from social psychology and the course-of-action has been used only once by Adé, Ganière and Louvet (2018). However, the data collected were not articulated, and their analyses and the results produced were carried out separately. Our study is a pioneer in this articulation between data and interview and questionnaire methods. Nevertheless, this articulation requires vigilance in several epistemological and methodological areas. It invites us to question the conditions to be respected so that this questionnaire, derived from social psychology, is used respecting the primacy of the intrinsic, whereas it is usually used independently of the ecological situation of the study. In our study, we used the CASS-S questionnaire as a means of helping to explain the lived experience, both for the students and for the researcher. In order to respect the primacy of the intrinsic, the use of this questionnaire in the observatory of the Course-of-Action Research Programme should make it possible to mobilise the pre-reflective consciousness of the student in order to access his/her authentic experience of a situation of teacher support. In order to contextualise the use of the questionnaire, the researcher proceeded in two stages: on the one hand, he targeted the items on the teacher by inserting the wording 'My PE teacher...'; on the other hand, he reminded the students, at the time of each questionnaire, that they should 'fill it in according to the lesson they had just experienced with their PE teacher'. In addition, the researcher made sure that each student could answer the questions in isolation, without feeling observed and without being able to interact with their peers. This point of vigilance was important so that

students would fill in the questionnaire with reference to their own experience in a particular lesson. The use of the questionnaire at this stage of the research thus reinforces the fruitfulness of mixed research methods, particularly in the context of the Course-of-Action observatory. In our study, the data collected are complementary in the sense of Greene et al. (1989), that is to say that their articulation makes it possible to bring to light results which would not have appeared without the use of this method. In fact, the results of the questionnaire shed additional light on how the students' perception of support evolved. Finally, the questionnaire made it possible to target the students with the strongest changes in their perception of the teacher's support at each period, in order to initiate Step 2 of our study on the analysis of the meanings given by students to the typical moments of support for each period. This approach, which starts from the quantitative to move towards the qualitative, is also a point of articulation between the methods (e.g. Adé et al. 2020, 202). Various research studies start from a large sample based on third-person data, making it possible to isolate (due to the methodological tools used) a phenomenon that could then be enriched based on first-person data (Seifert et al. 2017). In our study, the results of Step 1 made it possible to select the participants for Step 2 and to enrich the classic self-confrontation interview, to shed more light on our research purpose.

A methodological device as an aid to explain the experience to the students: the enriched self-confrontation interview

In the second stage of our study, we used the CASS-S questionnaire (Malecki and Elliott 1999) as a tool for the self-confrontation interview (Theureau 2010b). This tool contributes fully to the 'development' function of mixed-methods research (Greene, Caracelli, and Graham 1989), which consists of using data from one method to enrich another (Adé et al. 2020). Here, the use of questionnaire items, as well as the positioning of students on the associated Likert scales, provided assistance in both verbalising and making explicit the

students' experience. Indeed, these students present difficulties in verbalising their experience, on the one hand because of devalued self-esteem as they progress through school, and on the other hand because of a lack of vocabulary to express themselves, particularly to express their experiences (Guérin and Méard 2014). The questionnaire items, modelled in the form of vignettes for the students, enabled the researcher to help the students unblock the explanation of the situation they had experienced. A similar approach to enriching the self-confrontation interview was used by Ria et al. (2003) to study the experience of in-training PE teachers. They used the Estimation of Affective States to help participants estimate and synthesise the positive or negative emotionality of their experience and then conduct a self-confrontation interview. This method produced heuristic results on the emotional experiences of these young teachers. In our study, the researcher took the questionnaire item chosen by the student, either to validate his perception of the teacher's support or, conversely, to create controversy (convergence or divergence of verbalisation and questionnaire completion data). The researcher was therefore able to help the student put his experience into words: by linking the choice of item during the interview to the positioning on the Likert scales when the student filled in the questionnaire at the end of the filmed lesson, he was able to produce a more detailed explanation of the meanings that structured his experience. This methodological approach of enriching the explanatory data with that from the questionnaire echoes Mouchet et al.'s work on the 'composite interview' which consists in using different types of data to refine the contextual dimension in order to enrich the explanatory interview (Mouchet, Morgan, and Thomas 2018). In both cases, the objective of these methodological devices is to enrich the self-confrontation interview for the purpose of clarifying the actors' lived experience as precisely as possible.

To conclude, our study extends certain research currently being conducted within the framework of the Course-of-Action Research Programme to physical education, by crossing

576 experiential data with other types of data (biomechanical, physiological, kinetic), and shows
577 the fertility of a mixed-methods approach (Adé, Ganière, and Louvet 2018; Rochat et al.
578 2018). It argues for an articulation of different types of methods and data while retaining the
579 primacy of the intrinsic in order to provide heuristic results through triangulation,
580 complementarity, development, initiation and expansion (Greene, Caracelli, and Graham
581 1989).

References

Adé, David, Nathalie Gal-Petitfaux, Nadège Rochat, Ludovic Seifert, and Olivier Vors. 2020. 'L'analyse de l'activité dans les situations sportives par l'articulation de données hétérogènes : Réflexions et perspectives au service de l'ingénierie de conception'. *Activités* 17 (17–2). ARPACT - Association Recherches et Pratiques sur les ACTivités. doi:10.4000/activites.5448.

Adé, David, Caroline Ganière, and Benoît Louvet. 2018. 'The Role of the Referee in Physical Education Lessons: Student Experience and Motivation'. *Physical Education and Sport Pedagogy* 23 (4): 418–30. doi:10.1080/17408989.2018.1455818.

Arrighi, Jean-Jacques, and Céline Gasquet. 2010. 'Orientation et affectation : la sélection dans l'enseignement professionnel du second degré'. *Formation emploi*, no. 109 (March): 99–112. doi:10.4000/formationemploi.2814.

Bernard, Pierre-Yves, and Vincent Troger. 2012. 'La réforme du baccalauréat professionnel en trois ans ou l'appropriation d'une politique éducative par les familles populaires ?' *Education et societes* n° 30 (2). De Boeck Supérieur: 131–43. doi:10.3917/es.030.0131.

Bourbousson, J., G. Poizat, Jacques Saury, and Carole Sève. 2011. 'Description of Dynamic Shared Knowledge: An Exploratory Study during a Competitive Team Sports Interaction'. *Ergonomics* 54 (2): 120–38.

Corbin, Juliet M., and Anselm Strauss. 1990. 'Grounded Theory Research: Procedures, Canons, and Evaluative Criteria'. *Qualitative Sociology* 13 (1): 3–21. doi:10.1007/BF00988593.

Cox, Anne E., and Lavon Williams. 2008. 'The Roles of Perceived Teacher Support, Motivational Climate, and Psychological Need Satisfaction in Students' Physical Education Motivation'. *Journal of Sport & Exercise Psychology* 30 (2): 222–39.

Creswell, John W. 2015. *A Concise Introduction to Mixed Methods Research*. New York: Sage Publications.

Depraz, N., M. Gyemant, and T. Desmidt. 2017. 'A First-Person Analysis Using Third-Person Data as a Generative Method: A Case Study of Surprise in Depression - PhilPapers'. https://philpapers.org/rec/DEPAFA-6.

Greene, Jennifer C., Valerie J. Caracelli, and Wendy F. Graham. 1989. 'Toward a Conceptual Framework for Mixed-Method Evaluation Designs'. *Educational Evaluation and Policy Analysis* 11 (3): 255–74. doi:10.3102/01623737011003255.

Guérin, Jérôme, and Jacques André Méard. 2014. 'Conduite de l'entretien auprès des jeunes scolaires : le cas de l'autoconfrontation dans une approche « orientée – activité »'. *Canadian Journal of Education/Revue canadienne de l'éducation* 37 (1): 120–120. https://journals.sfu.ca/cje/index.php/cje-rce/article/view/1493.

Jellab, Aziz. 2016. 'Un ordre d'enseignement paradoxal : le lycée professionnel comme analyseur des avancées et des obstacles à la démocratisation scolaire'. *Education et societes* n° 38 (2). De Boeck Supérieur: 123–38. https://www.cairn.info/revue-education-et-societes-2016-2-page-123.htm.

———. 2017. ‘Les voies professionnelles, entre relégation et valorisation’. *Administration & Éducation* N° 155 (3): 109–21. http://www.cairn.info/revue-administration-et-education-2017-3-page-109.htm.

Ladd, G. W., and K. B. Burgess. 2001. ‘Do Relational Risks and Protective Factors Moderate the Linkages between Childhood Aggression and Early Psychological and School Adjustment?’ *Child Development* 72 (5): 1579–1601. doi:10.1111/1467-8624.00366.

Lubans, David R., Philip J. Morgan, and Ann McCormack. 2011. ‘Adolescents and School Sport: The Relationship between Beliefs, Social Support and Physical Self-Perception’. *Physical Education and Sport Pedagogy* 16 (3). Routledge: 237–50. doi:10.1080/17408989.2010.532784.

Malecki, Christine, and Stephen Elliott. 1999. ‘Adolescents’ Ratings of Perceived Social Support and Its Importance: Validation of the Student Social Support Scale’. *Psychology in the Schools* 36 (November): 473–83. doi:10.1002/(SICI)1520-6807(199911)36:6<473::AID-PITS3>3.0.CO;2-0.

Merleau-Ponty, M. 1945. *Phénoménologie de La Perception*. Gallimard. Paris, France.

Mouchet, Alain, Kevin Morgan, and Gethin Thomas. 2018. ‘Psychophenomenology and the Explicitation Interview for Accessing Subjective Lived Experience in Sport Coaching’. *Sport, Education and Society* 0 (0): 1–14. doi:10.1080/13573322.2018.1495189.

Pianta, Robert C., Bridget K. Hamre, and Joseph P. Allen. 2012. ‘Teacher-Student Relationships and Engagement: Conceptualizing, Measuring, and Improving the Capacity of Classroom Interactions’. In *Handbook of Research on Student Engagement*, edited by Sandra L. Christenson, Amy L. Reschly, and Cathy Wylie, 365–86. Boston, MA: Springer US. doi:10.1007/978-1-4614-2018-7_17.

Poulou, Maria S. 2017. ‘Social and Emotional Learning and Teacher–Student Relationships: Preschool Teachers’ and Students’ Perceptions’. *Early Childhood Education Journal* 45 (3): 427–35. doi:10.1007/s10643-016-0800-3.

Ria, Luc, Jacques Theureau, Carole Sève, Jacques Saury, and Marc Durand. 2003. ‘Beginning Teacher’s Situated Emotions : Study about First Classroom’s Experiences’. *Journal of Education for Teaching* 29 (3). Taylor & Francis (Routledge): 219–33. https://hal.archives-ouvertes.fr/hal-00803989.

Rochat, Nadège, Vincent Gesbert, Ludovic Seifert, and Denis Hauw. 2018. ‘Enacting Phenomenological Gestalts in Ultra-Trail Running: An Inductive Analysis of Trail Runners’ Courses of Experience’. *Frontiers in Psychology* 9. doi:10.3389/fpsyg.2018.02038.

Rochat, Nadège, Denis Hauw, and Ludovic Seifert. 2019. ‘Enactments and the Design of Trail Running Equipment: An Example of Carrying Systems’. *Applied Ergonomics* 80 (October): 238–47. doi:10.1016/j.apergo.2018.07.002.

Roorda, Debora L., Helma M. Y. Koomen, Jantine L. Spilt, and Frans J. Oort. 2011. ‘The Influence of Affective Teacher-Student Relationships on Students’ School Engagement and Achievement: A Meta-Analytic Approach’. *Review of Educational Research* 81 (4): 493–529. doi:10.3102/0034654311421793.

Rueger, Sandra Yu, Christine Kerres Malecki, and Michelle Kilpatrick Demaray. 2010. ‘Relationship Between Multiple Sources of Perceived Social Support and

Psychological and Academic Adjustment in Early Adolescence: Comparisons Across Gender'. *Journal of Youth and Adolescence* 39 (1): 47–61. doi:10.1007/s10964-008-9368-6.

Sartre, Jean-Paul. 1960. *Critique de La Raison Dialectique Précédé de Questions de Méthode*. Gallimard. Bibliothèque Des Idées. Paris, France.

Seifert, Ludovic, Julien Lardy, Jérôme Bourbousson, David Adé, Antoine Nordez, Régis Thouvarecq, and Jacques Saury. 2017. 'Interpersonal Coordination and Individual Organization Combined with Shared Phenomenological Experience in Rowing Performance: Two Case Studies'. *Frontiers in Psychology* 8 (January). doi:10.3389/fpsyg.2017.00075.

Smith, Brett, and Kerry R. McGannon. 2018. 'Developing Rigor in Qualitative Research: Problems and Opportunities within Sport and Exercise Psychology'. *International Review of Sport and Exercise Psychology* 11 (1): 101–21. doi:10.1080/1750984X.2017.1317357.

Stanger, Nicholas, Susan H. Backhouse, Andrew Jennings, and Jim McKenna. 2018. 'Linking Motivational Climate with Moral Behavior in Youth Sport: The Role of Social Support, Perspective Taking, and Moral Disengagement'. *Sport, Exercise, and Performance Psychology* 7 (4). US: Educational Publishing Foundation: 392–407. doi:10.1037/spy0000122.

Suchman, Lucy A. 1987. *Plans and Situated Actions: The Problem of Human-Machine Communication*. Cambridge University Press.

Suldo, Shannon M., Allison A. Friedrich, Tiffany White, Jennie Farmer, Devon Minch, and Jessica Michalowski. 2009. 'Teacher Support and Adolescents' Subjective Well-Being: A Mixed-Methods Investigation'. *School Psychology Review* 38 (1): 67–85. doi:10.1080/02796015.2009.12087850.

Tardy, Charles H. 1985. 'Social Support Measurement'. *American Journal of Community Psychology* 13 (2): 187–202. doi:10.1007/BF00905728.

Teddlie, Charles, and Abbas Tashakkori. 2009. *Foundations of Mixed Methods Research: Integrating Quantitative and Qualitative Approaches in the Social and Behavioral Sciences*. SAGE.

Tennant, Jaclyn E., Michelle K. Demaray, Christine K. Malecki, Melissa N. Terry, Michael Clary, and Nathan Elzinga. 2015. 'Students' Ratings of Teacher Support and Academic and Social–Emotional Well-Being.' *School Psychology Quarterly* 30 (4): 494–512. doi:10.1037/spq0000106.

Theureau, Jacques. 2006. *Le Cours d'action: Méthode Développée*. Edited by Octares. https://hal.archives-ouvertes.fr/hal-01107065.

———. 2010a. 'La Constitution de Savoirs Dans l'action'. *Intellectica* 53 (1). Persée-Portail des revues scientifiques en SHS: 95–127.

———. 2010b. 'Les entretiens d'autoconfrontation et de remise en situation par les traces matérielles et le programme de recherche « cours d'action »'. *Revue d'anthropologie des connaissances* Vol 4, n° 2 (2). S.A.C.: 287–322. https://www.cairn.info/revue-anthropologie-des-connaissances-2010-2-page-287.htm.

———. 2015. *Le cours d'action : l'enaction & l'expérience*. Toulouse: Octarès Editions. https://www.decitre.fr/livres/le-cours-d-action-l-enaction-l-experience-9782366300468.html.

Varela, Francisco J. 1996. 'Neurophenomenology: A Methodological Remedy to the Hard Problem'. *Journal of Consciousness Studies* 3 (4): 330–49. http://cepa.info/paper.cgi?id=1893&action=add.

Varela, Francisco J., Evan Thompson, and Eleanor Rosch. 2017. *The Embodied Mind, Revised Edition: Cognitive Science and Human Experience*. MIT Press.

Wang, Ming-Te, and Jacquelynne S. Eccles. 2012. 'Social Support Matters: Longitudinal Effects of Social Support on Three Dimensions of School Engagement From Middle to High School: Social Support'. *Child Development* 83 (3): 877–95. doi:10.1111/j.1467-8624.2012.01745.x.

Wentzel et al. 2010. 'Social Supports from Teachers and Peers as Predictors of Academic and Social Motivation'. *Contemporary Educational Psychology* 35 (3): 193–202. doi:10.1016/j.cedpsych.2010.03.002.

Wentzel, Kathryn R. 1998. 'Social Relationships and Motivation in Middle School: The Role of Parents, Teachers, and Peers'. *Journal of Educational Psychology* 90 (2): 202.

Wentzel, Kathryn R., Katherine Muenks, Daniel McNeish, and Shannon Russell. 2017. 'Peer and Teacher Supports in Relation to Motivation and Effort: A Multi-Level Study'. *Contemporary Educational Psychology* 49 (April): 32–45. doi:10.1016/j.cedpsych.2016.11.002.

Response to Academic Editor

Dear Editor,

Please find attached a revised manuscript entitled "*The student's experience of teacher support in French vocational high-school classes with difficulties in school engagement in physical education: interest of mixed methods research*" that my colleagues and I are submitting to PESP. We very much appreciate the feedback that you and the reviewers have provided. We have carefully attended to each of your and the reviewers' points; we summarise the way in which we have done so below. Thank you for considering our paper for publication, and thank you again for your and the reviewers' insights, which have helped us improve the manuscript.

Sincerely,

Response to Reviewers

The authors would first like to thank the reviewers for the quality of their comments, always relevant and constructive, testifying to the interest they have in this study. We have corrected and modified the text following all the reviewers' comments. Different types of corrections were to be made. The changes we have made are highlighted in yellow in the manuscript.

Reviewer #1

General comment :

Thank you for the opportunity to review this manuscript. I understood that the primary purpose of this manuscript was to show the strengths of mixed methods within the Course-of-Action Research Programme, as the authors(s) wrote this notion in the discussion. However, there seems to be a mismatch between the introduction and discussion because, from my reading of the introduction, I expected that the authors(s) wanted to discuss changes in students' perception of teacher support in physical education across the year, using a mixed-method approach. While I agree the topic is worthwhile, there are some critical concerns at this stage.

Thank you for your interest in our article. Your comments have helped us to make the purpose of this article more readable. Indeed, this article aims to demonstrate the contribution of mixed methods research in PE for a special issue following a symposium on the subject. Thanks to your comments, we have tried to clarify this objective. This article outlines our mixed methods research which focuses on the teacher support perceived and experienced by students to help them engage with their work.

Major comments :

Comment #1:

My major concern is about the storyline of the manuscript. Suppose the focus of this manuscript is to show the contribution of mixed methods research. In that

sense, I believe that the author(s) might need a statement about the issues and rationales for mixed methods research at first in the introduction. For instance, it would be worth providing narrative reviews on the research paradigm for mixed methods and how mixed methods contribute to building high-quality pedagogical research. The way the author(s) have written may lead readers to think that the paper will add new insight into how the vocational high-school students' perceptions of teacher support have changed over the year. That would not be a problem if the author(s) pursued this aspect. However, there is no discussion on this matter in the current state. At any rate, I feel that a closer alignment between the introduction and discussion is required.

Thank you for pointing out this aspect of the article which indeed needed to be reviewed. We have rewritten the entire introduction in order to make clear the purpose of this article, i.e. to outline the added value of a mixed method research design in the Course of Action research programme to study the perceived and experienced support of vocational school students in situations.

Comment #2:

The other concern is that the self-confrontation interview data is a rather limited in the results section. The author(s) argued that the use of mixed methods enriched the explanatory data on students' perceptions of teacher support for students' engagement. Yet there is only one example of the self-confrontation interviews supporting this. The readers might be curious to see more examples to show enriched data on the students' experiences. Also, it would be helpful if the author(s) could elaborate on the contexts of the observed class to see what happened in the class. Additionally, I think it might be better to combine Figure 3

with Figure 1 as this way makes it possible to clarify the process of analysis in qualitative data.

Following your proposal, we have combined figure 3 and figure 1 to make our proposal more readable. This figure is now called [Table 1] on page 13.

Table 1. Example of enriched self-confrontation interview: Marius "High" (3rd, lesson 3 badminton)

[Researcher]: What's going on there?
[Marius]: Well, we were actually playing against a team and I sent it back a little too short, and Thomas sent it back. So I went to ask him [the teacher] if we were allowed to do that, I basically did a pass to him.
[Researcher]: And Is the teacher telling you?
[Marius]: He is telling me that it's not good, that you're not allowed to make passes.
[Researcher]: What does it do to you?
[Marius]: It's good because you are listened to and you get an answer when he could have kept on playing (with Faustina). (The teacher was busy doing a demonstration with another group of students).
[Researcher]: How does it feel for you at that moment?
[Marius]: Good, because he answers us directly, because right now he's talking with a student, he was going to play but he waited for me to ask him my question and answer it.
[Researcher]: In which vignette (visual representation, on a sheet of paper, of the questionnaire items from study 2) would you put what you told me?
Marius]: Yeah. [Marius]: Yeah. This one (Marius chooses as a vignette: "agree to be asked questions")
[Researcher]: How do you feel at that moment?
[Marius]: Good
[Researcher]: How well?
[Marius]: Good because he answers us directly, because right now he's talking with a student, he was going to play but he waited for me to ask him my question and answer it.
[Researcher]: Is it important for you that he answers you well?
[Marius]: Yes, it gives us confidence, because if you have a teacher who doesn't listen to you, who just does his job...well, you're not going to like him very much

Identification of components of Marius' lived experience of teacher support			
Actions and communications in the lesson	Concern	Perceptions	Knowledge
Marius goes to see the teacher to ask him a question about the rules of the doubles game.	Wants to know if he is allowed to pass to his doubles partner.	See that the teacher stops demonstrating to answer his question while he was playing with Faustine.	Knows that he can ask the teacher a question without the teacher "blowing him off".

Also, we have completely revised the presentation of the qualitative results highlighting the original issue focusing on the typical-support.

Moreover, we provide more examples of interviews during the presentation of the results, especially to show the controversial effects of such a method (p. 21; l. 405-414): *“In the same way, a support evaluated as very frequent when completing the questionnaire, does not seem to presage a support experienced as meaningful for the student. For example, William (AC_William-S3Table Tennis) self-reported his perception of the frequency of informational support as "always". From the analysis of his experience, it can be understood that he negatively perceives the large number of instructions. These interventions by the teacher are out of step with his own concerns. William's preoccupation at that moment was to practice: "It's long because I already know it, I want to play". The teacher's activity perceived and described as a support by the student is experienced as a brake on his desire to practice at that moment. This example shows a dissonance between the "perceived support" questionnaire and the "experienced support" of the student in the situation and confirms that the support experienced by the students is dependent on their concerns in the action*.”

The explanation of the originality and method of the enriched self-confrontation interviews has been developed in the method section: *“Following the recording of each lesson, two students having "high scores” or a significant variation between two sequences per class were invited to participate in an enriched self-confrontation interview in each period, in order to carry out an analysis of their experience of receiving support from their teacher (72 individual interviews in total). These interviews were initially conducted according to the course-of-action approach: confronted with the recording, students were invited to show, mime, simulate, tell and*

comment on their activity. In this way, they explained their lived experience of the teacher's support activity, including their concerns, perceptions and knowledge in the moment being studied (Theureau 2010b). In order to go further, the researcher used CASS-S questionnaire items previously filled in by the students, without making their answers and scores visible to them. Only the items filled in by the student were presented during the interview in the form of schematic vignettes on a sheet of A4 paper.

The purpose of the 12-item self-comparison interview instrument was to help the student to better explain and qualify the moment of support he/she was talking about, and thus enable the researcher to refine his questioning in order to access more precise meanings for the student about the support. For example, the researcher asked the student: "You just told me that the fact that the teacher challenges you makes you want to do more. Can you tell me in which vignettes you would put what the teacher is doing?". From then on, when the experience explained by the student referred to the teacher's support activity, the researcher presented these items of the questionnaire to the student, inviting him or her to select an 'item' vignette that corresponded most closely to what they had just said. Depending on the position of the perception of the teacher's support by the student on the Likert scale (Step 1) for the chosen item, the researcher would then use this as a tool for further questioning in order to validate the student's statement or to create controversy in the event that a significant difference appeared between the initial response to the questionnaire and what he/she was explaining during the interview. In the case of a significant discrepancy between the item chosen and the answer given on the questionnaire, the researcher was able to question the student about this dissonance in order to deepen the explanation of his/her lived experience of the support received from the teacher."

Minor comments:

*Comment **#1 P4L29***

Could you provide examples of "the teacher's support activity"? I also wonder how this is related to Tardy's model.

Examples of teacher support activities are described from the students' perspective in the results section (Step 2) (P19 L358). Tardy's (1985) definition of social support allows us to have a pre-existing categorisation of the different types of support. He invites us to investigate more precisely the support experienced by the student in order to note or not a convergence between the different types of support he perceived and the one he experienced.

Comment #2 L-26-27

What does "3e PM" mean? Is it the name of the class?

3e PM" is in fact the French acronym for the "3ème Préparation aux Métiers" class. This level is a transitional level between middle school and vocational high school for students with serious academic difficulties and most often with behavioural problems in class.

We have changed this name in the text to make it more readable for the English-speaking community : "*3rd Career Preparation"*

Comment #3 P8L5-8

What is your rationale for administrating the questionnaire at the end of the third lesson?

We chose the third lesson because it corresponds to half of each teaching sequence. It constitutes a privileged character of study of the activity of the students because the lessons in the middle of the cycle are not evaluated.

Comment #4 P11

I am not sure if Figure 1 is necessary here just to give an example of moments where the researchers used the vignettes during the self-confrontation interviews. Instead, the author (s) might want to report this in the results?

We have followed your advice to combine Figure 1 and Figure 3. We have left it in the method section for the moment to illustrate the processing of the data, but if you think it is more appropriate to put it in the results section, we can revise our layout.

Comment #5 P13

The line graph should be named "Figure 2".

We have changed the way the results are written and the names of the figures and tables.

Comment #6 P14L49

How did you identify typical moments of teacher support? The questionnaire results did not seem to show the frequency of students' perceptions of teacher support during a lesson. I assume that the author(s) identified typical moments of teacher support by their observations rather than the questionnaire results. If so, what were the criteria for this?

Thank you for your relevant advice. We have abandoned the notion of typical moment. The CASS-S questionnaire allows us to identify the frequency of perceived support and its importance. We therefore chose the students with the highest perception of support

in order to be certain that, at the time of the interview, they had already declared that they perceived a supportive teacher.

Comment #6 P17L3

The author(s) described that they adopted "mixed methods (quantitative then qualitative)". As far as I know, this research design is often called an exploratory sequential mixed method design. Please refer to this terminology if you agree.

In line with your proposal, we have incorporated the concept of exploratory sequential mixed method design into our text:

(P5 L59-82). Some Mixed Methods Research seems to be able to give us access to the meanings given by the student to the support they receive from their physical education teacher and the effects of their engagement in school tasks. Mixed methods are defined as 'the design of mixed methods such as those which include at least one quantitative and one qualitative method, where neither type of method is intrinsically linked to a particular paradigm' (Greene, Caracelli, and Graham 1989). The use of different methods aims to shed light on the research hypotheses by articulating and crossing heterogeneous data (qualitative and quantitative) (Creswell and Plano Clark, 2018). Green et al. (1989) put forward several functions to the mixed methods: triangulation (convergence, corroboration, correspondence of results from the different methods), complementarity (elaboration, enhancement, illustration, clarification of the results from one method with the results from the other method), development (use the results from one method to help develop or inform the other method), initiation (the discovery of paradox and contradiction, new perspectives of frameworks, the recasting of questions or results from one method with questions or results from the other method) and expansion (extend the breadth and range of inquiry by using different methods for different inquiry components). Teddlie and Tashakkhori (2009) propose a classification

of the usefulness of mixed methods into five categories: Parallel Mixed Designs, Sequential Mixed Designs, Conversion Mixed Designs, Multilevel Mixed Designs, Fully Integrated Mixed Designs. This classification highlights different levels of articulation and the complementarity of methods: from the use of quantitative and qualitative methods in parallel at the same time (Parallel Mixed Designs), to a permanent interaction of quantitative and qualitative methods at each level of the research (Fully Integrated Mixed Designs). In order to access the experience lived by students when they receive support from their teacher, the use of Mixed Methods enables us to consider triangulation and complementarity of the data collected at different levels of our study.""

Indeed, the term is commonly used and is even referred to in the latest reprint of Creswell, J. W., & Plano Clark, V. L. (2018). Designing and Conducting Mixed Methods Research. Sage.

Comment #7 P17L17-24

The sentences "We also cross-matched our CASSS…the student's experience of support" seem just to reiterate the methods the author(s) have used.

We follow your pertinent advice:

P25 L501"*We ~~also~~ cross-matched our CASS-S questionnaire and self-comparison interview methods at several levels of our study: (a) at the level of Step 1, to describe the perception of support during the year by students, (b) at the level of the enriched self-comparison interview, to enhance the explicitation of the student's experience of support, to understand the meaning they give to the support experienced in the classroom."*

Reviewer #2

Comment #1

Many thanks for your submission and for the opportunity to read about your project. I think a considerable amount of thought and work has gone into this project. However the manuscript is not ready for publication. Although I feel the topic of this paper will be of interest of readers of PESP, I feel the paper does not meet the standards for research quality and suitability for PESP readership. I hope the following recommendations are useful to the authors.

Dear Expert, thank you for your careful reading of our article and the various comments that followed.

We have followed each remark and completely modified the Introduction session, Methodological session and Results session. Therefore, we have gone back over the entire article in order to make the article, which illustrates a part of the thesis, more coherent and more readable. We do our best to make this original methodology clear. We hope that the proposed new version will live up to the journal's expectations.

Comment #2

The paper does not lack a theoretical framework in the introduction, as teacher social support theories are described. However, I see serious inconsistences in the methods sections. This study discusses two issues. The first issue is how the student perception of the social support teacher evolves over the course of an academic year[1]. The perception by the students of the teacher's social support is the dependent variable in this quantitative part of the study. Therefore, the perception

of students depends on the social support teacher, which would be the independent variable. However, the study does not provide any description of what is relative to this variable. It does not describe who the teachers were, how they were trained, or whether they followed any protocol or programme for the development of social support. Therefore, from my point of view, this part of the study lacks the necessary internal validity because the independent variable is not sufficiently controlled, so it does not enable it to be replicated[2]. Different teachers would support their students differently, and their impact on students' perception of teacher social support would be different.

[1]Thanks a lot for your advice. We saw we weren't clear at all. So we reworked the theoretical part and the methodological session: (P9 L167-210)

"*Step 1 - Analysis of Teacher Social Support using child and adolescent social support scale (CASS-S; (Malecki and Elliott 1999)*

Step objective

This descriptive step was carried out with 10 classes. The goals were to give a global vision about teacher social support in "difficult" classes. Thus, we identified and characterised the perception of teacher support by students in three different PE teaching sequences during a school year. Also, in order to characterise more precisely the students' global perception of support, we analysed the variations in support between two teaching sequences. Then, the goal was to identify groups of students who have a high perceived support frequency and/or importance score or a significant variation in scores between two sequences in order to carry out an in-depth qualitative analysis (Step 2).

Data collection via the CASS-S questionnaire

The data collection for this study was carried out through the CASS-S questionnaire (Malecki and Elliott 1999). It represents a methodological device used for the first time in the context of Course-of-Action research in order to gain access to experience over a longer period of time (one year) and for a large number of students (245). This CASS-S questionnaire measures, via two Likert scales (from 'Never' to 'Always', and from 'Not important' to 'Very important'), the frequency and importance of the perception of the teacher's social support by students on 12 items assessing each of the four components of social support: emotional support, informational support, appraisal support, instrumental support, with reference to Tardy's Social Support model (1985). This tool, borrowed from social psychology, aims to assess the perception of social support from the teacher, peers and family. In our study, this CASS-S questionnaire is used to report on students' past experience of teacher support during the physical education lesson that had taken place shortly before. We then contextualised the use of the questionnaire when it was given to the students: 'You have to fill in the questionnaire according to what you have just experienced in this lesson with teacher X'. The questionnaire was filled in by all the students in the 10 classes followed (N=245) at the end of the 3rd lesson out of 7 during three teaching sequences (Three different sports teaching). The third lesson was chosen because it was in the middle of the teaching sequence and was not concerned with an assessment of students' learning. In order to place the students in good conditions for data collection, they were spaced apart from one another, the researcher stayed close to them to help them understand certain items and the teacher remained at a distance from the students. After the three rounds, only 65 students out of the initial 245 had completed the questionnaire on all three occasions; these defections are typical for the public studied (frequent absenteeism).

Processing of data from the CASS-S questionnaire

The data collected by questionnaire were processed as follows: (1) calculation of the scores obtained for each questionnaire for perceived support measured during a teaching sequence by students of 10 classes in order to identify the perception of support from their PE teacher; (2) statistical analysis using repeated measures ANOVA tests to characterise variations in students' perceived teacher social support across teaching sequences; (3) selection for the qualitative analysis of students who scored high or a significant variation in score between two sequences on the overall score of their perception of their teacher's social support."

Our research is rooted in Mixed Method Research, with a phenomenological approach to the Course of Action Research Programme. The theoretical framework of social support, derived from social psychology, was used to characterise the teacher support identified in an exploratory study. We therefore used tools to measure it in the classroom but we do not use social psychology for explanatory purposes in our research.

P7 L109: "Our mixed method was operationalised through the use of the questionnaire tool in data collection. We used the CASS-S Questionnaire at different steps in our study. The CASS-S questionnaire tool was used to analyse, at a collective level, the students' perception of the teacher's social support. Then, this questionnaire was used at an individual level, during the self-confrontation interviews to help verbalise the students' experience of support. Child and Adolescent Social Support Scale Questionnaire (CASS-S) measures the appreciation by students of four types of social support received (Tardy, 1985) from a global network (teacher, parents, peers) (Malecki and Elliott 1999), inspired by the Mixed Method Research (Greene, Caracelli, and Graham 1989; Teddlie and Tashakkori 2009). Various studies in sport carried out in this framework have shown the fertility advantage of combining heterogeneous data

(crossing experiential with biomechanical or kinetic or physiological data) (Gal-Petitfaux et al. 2013; Rochat et al. 2018; Vors et al. 2019). Here we are interested in heterogeneous data that enable us to better understand students' lived experience of teacher support."

Following your feedback we did a more detailed analysis of our results, we abandoned the notion of "evolution of the perception of social support" in the article. Because you are right, the paper do not focus on this evolution. P7 "*In our study, the use of a mixed method aims to describe and understand, at a collective and individual level, the general and experiential views of students and the meanings they attach to their teacher's social support. Thus, we have identified the typical supportive moments experienced by students that enable them to engage in class work."*

We used the questionnaire tool only to describe the perception of overall social support and of each type of support by the students at three different times during the year. This step allowed us to (1) identify whether the students in the 10 classes studied perceived support from their teacher and whether it was important to them, and thus to establish a class profile; (2) identify the students emblematic of a high perception of support at each teaching sequence in order to continue with a qualitative study with the aim of understanding what makes sense of this perceived support in situation.

These clarifications have been made in the method section:

P10 "Step 1 - Analysis of Teacher Social Support using child and adolescent social support scale (CASS-S; (Malecki and Elliott 1999)

Step objective

This descriptive step was carried out with 10 classes. The goals were to give a global vision about teacher social support in "difficult" classes. Thus, we identified and characterised the perception of teacher support by students in three different PE

teaching sequences during a school year. Also, in order to characterise more precisely the students' global perception of support, we analysed the variations in support between two teaching sequences. Then, the goal was to identify groups of students who have a high perceived support frequency and/or importance score or a significant variation in scores between two sequences in order to carry out an in-depth qualitative analysis (Step 2)."

P11-12: "Step 2 –Comprehensive analysis by means of self-confrontation interviews enriched with the CASS-S questionnaire

Step objective

The objective of Step 2 was to understand for each 'high score' student what they experienced in the form of typical-support that helped them engage in the work. Typical support corresponds to an action that is experienced as significant for the student in the situation. This typical support is considered typical when it corresponds to four aspects (Durand, 2014): descriptive (i.e., the typical occurrence presents the highest number of traits of the experience analyzed in the sample of participants and the situations studied); statistical (i.e., the typical occurrence is the one most frequently observed in the sample studied); generative (i.e., the typical occurrence has a propensity to recur when conditions resembling those observed are reproduced), and significant (i.e., actors express a feeling of typicality when they are questioned about it during enactive interview). Thus, we seek to understand how the teacher's support activity was experienced by the students and how this lived support organised their involvement in the work requested by the teacher."

2Thank you for this comment. We had omitted the characteristics of the PE teachers studied. We have filled in these gaps in the method: (P8-L145)*" The 10 PE teachers*

had more than 5 years' experience of teaching in vocational schools. They were familiar with the problems of these students and were committed to helping the students enjoy practising and investing in PE. The four teachers in the case study were very involved in the schooling of their class by being the class's main teacher and had a great deal of experience in supporting students in their school career.". On the other hand, the quantitative study does not aim to analyse the teacher's pedagogy, but rather to understand what is experienced as supportive by the students. The aim of our study is to understand what in the teachers' activity, characterised as "supportive" by the students, makes sense to them in the situation. In other words, it is to understand and analyse what a typical medium is from the students' point of view.

Comment #2

I therefore consider that the first part of this study has an incorrect approach. It can be used to learn how TSS perception has evolved in these students, but simply in order to classify students for the second phase and extract the sequences that would be analyzed from a qualitative point of view, but not in order to extract conclusions from the results obtained, as it would lack internal validity. As a result, the study also could not be considered as a mixed methods research

Thank you for the critical comment that allowed us to develop this part further in order to allow a better understanding of our methodology. We have fully restructured the Methodological and Results section to take account of your remark.

Our objective is to understand from the students' point of view what makes sense to them in the support activity they perceive and experience from their teacher. *: (L122)"In our study, the use of a mixed method aims to describe and understand, at a collective and individual level, the general and experiential views of students and the*

meanings they attach to their teacher's social support. Thus, we have identified the typical supportive moments experienced by students that enable them to engage in class work."

(L170): "The goals were to give a global vision about teacher social support in "difficult" classes. Thus, we identified and characterised the perception of teacher support by students in three different PE teaching sequences during a school year. Also, in order to characterise more precisely the students' global perception of support, we analysed the variations in support between two teaching sequences. Then, the goal was to identify groups of students who have a high perceived support frequency and/or importance score or a significant variation in scores between two sequences in order to carry out an in-depth qualitative analysis (Step 2)".

The first stage of the quantitative study therefore answers the following questions: Do students in vocational high school classes receive support from their teacher? How often? Is it important to them? How does this perceived support relate to Tardy's (1985) classification of the four types of support? Is this perceived support the same from one teaching sequence to another?

We therefore processed the questionnaires in two stages: (1) calculation of the scores obtained by students and analysis of the averages from one learning sequence to another. These results show us a relative stability of the students' perception of support over the year. (2) we asked ourselves what types of support were perceived to be predominant in each sequence, did they change between two sequences? The results of the ANOVA tests allow us to show that Apraisal Support is the only support to vary significantly.

(L305) : "*Teacher support perceived frequency et importance during the year*

The average scores of the CASS-S questionnaire obtained by the students in the 10 classes showed a high perception of support from their teacher throughout the year. Indeed, students reported perceiving support from their teacher "almost always" to "always" (50.8/72). This support was perceived by the students as "important" or "very important" (27.5/36) ***[Table 2].”***

(L315) ***: “****Teacher support perceived fluctuates between different teaching sequences*

Although the mean scores obtained in each CASS-S questionnaire were relatively stable between different teaching sequences, the statistical analysis of variance shows a significant variation in the perception of support over the year (F(1, 65) = 30.267, p < .001). This significant variation in the perception of support indicates that teacher support makes sense in different ways to students depending on the sequence in which it is provided. The Bonferroni test showed, in fact, that students' perceived support was more frequent in the third teacher sequence ***[Figure 1]****. The importance of students' perceived support decreased slightly in the second learning sequence and increased again in the third sequence* ***[Figure 2]****.*

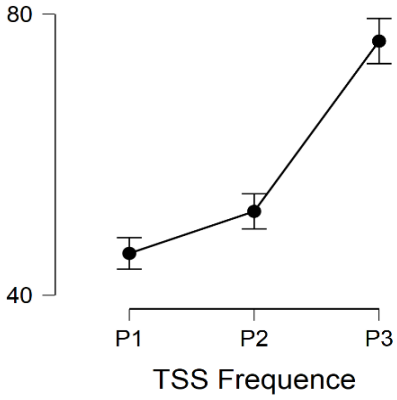

Figure 5. Plots description of Variation in the frequency of perceived teacher social support (TSS) over the three teaching sequences

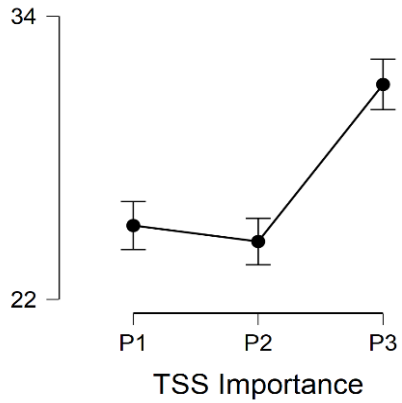

Figure 6. Plots description of Variation in the importance of perceived teacher social support (TSS) over the three teaching sequences

Further analysis of the categories of self-reported support (emotional, informational, apraisal and instrumental) shows a significant variation in apraisal support while the others remain stable (p>0.05) ***[Table 3].*** *Indeed, depending on the teaching sequence, the ANOVA test showed that apraisal support (positive feedback on their work) varied significantly over the year in frequency (F (1, 65) = 191.545, p < .001); and in importance (F (1, 65) = 255.424, p < .001). Indeed, the Bonferroni test results show that the frequency of apraisal support increases sharply between the first and second teaching sequences (pbonf < .001) and then stabilises in the third sequence (Figure 3). While the importance of this same support is relatively stable between the first two teaching sequences (pbonf = 1) and increases during the third sequence (pbonf < .001)* ***[Figure 4]****. The meanings of the support perceived by the students thus seem to change from one sequence to the next.*

Table 3. ANOVA Test of the variance of each type of support

Type of support	*Emotional Support*	*Informational Support*	*Apraisal Support*	*Instrumental Support*
Frequency	*0.847*	*0.607*	*<0.001*	*0.915*
Importance	*0.322*	*0.374*	*<0.001*	*0.986*

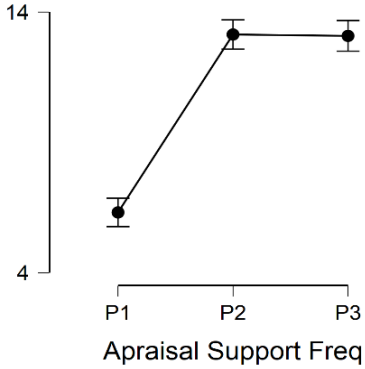

Figure 7. Plots description of Variation of the apraisal frequency support perceived during the three teaching sequences

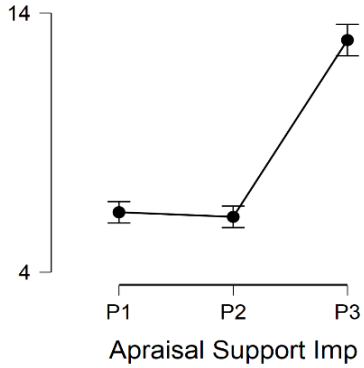

Figure 8. Plots description of Variation in the importance of perceived support over the three teaching sequences

This quantitative overview gives a global view of the support perceived by the students, and also shows some variability between the three periods. Beyond this snapshot, we thought it would be interesting to carry out a complementary qualitative analysis to understand how this perceived support helps them to engage in the school work required."

These results raised questions about the literature review, which focuses on emotional support.

We consider our research to be a Mixed Method of research because we used two types of complementary tools (Greene et al., 1989) to answer our research question: to identify and characterise the support perceived by the students, to understand how this perceived support was experienced by the students in class while raising the controversies that can be generated by the use of these two tools.

Comment #3

On the other hand, there are some other issues the authors should also take into consideration.

First, the abstract misses a lot of relevant information (purpose, settings and participants, and conclusions); and the qualitative instrument is not mentioned.

Thank you for your comment, we have revised the summary and added the missing information you mentioned.

Comment #4

Second, although the process of collecting qualitative data is described, I cannot appreciate what qualitative strategy of data analysis has been used. A wider description of the interview in the form of schematic vignettes is needed. What is more, although 12 individual interviews were done to the selected students (2), only one item from one interview of one student is presented in the results section. I think a narrative could be constructed about the evolution of those two subjects.

We apologise for the misunderstanding generated by this part of the article. Our aim was to illustrate our method with one of the four case studies (72 self-confrontation interviews conducted). We have therefore tried to clarify the subject in the method section and we have tried to give more examples that would have allowed us to highlight the typical supports experienced by the students in the situation.

(L267) "*Table 1. Example of enriched self-confrontation interview: Marius "High' (3rd, lesson 3 badminton)*

[Researcher]: What's going on there?

[Marius]: Well, we were actually playing against a team and I sent it back a little too short, and Thomas sent it back. So I went to ask him [the teacher] if we were allowed to do that, I basically did a pass to him.

[Researcher]: And Is the teacher telling you?

[Marius]: He is telling me that it's not good, that you're not allowed to make passes.

[Researcher]: What does it do to you?

[Marius]: It's good because you are listened to and you get an answer when he could have kept on playing (with Faustina). (The teacher was busy doing a demonstration with another group of students).

[Researcher]: How does it feel for you at that moment?

[Marius]: Good, because he answers us directly, because right now he's talking with a student, he was going to play but he waited for me to ask him my question and answer it.

[Researcher]: In which vignette (visual representation, on a sheet of paper, of the questionnaire items from study 2) would you put what you told me?

Marius]: Yeah. [Marius]: Yeah. This one (Marius chooses as a vignette: "agree to be asked questions")

[Researcher]: How do you feel at that moment?

[Marius]: Good

[Researcher]: How well?

[Marius]: Good because he answers us directly, because right now he's talking with a student, he was going to play but he waited for me to ask him my question and answer it.

[Researcher]: Is it important for you that he answers you well?

[Marius]: Yes, it gives us confidence, because if you have a teacher who doesn't listen to you, who just does his job...well, you're not going to like him very much

---

Identification of components of Marius' lived experience of teacher support

Actions and communications in	*Concern*	*Perceptions*	*Knowledge*

the lesson			
Marius goes to see the teacher to ask him a question about the rules of the doubles game.	*Wants to know if he is allowed to pass to his doubles partner.*	*See that the teacher stops demonstrating to answer his question while he was playing with Faustine.*	*Knows that he can ask the teacher a question without the teacher "blowing him off".*

This excerpt illustrates, among the 72 enriched interviews conducted, the use of the questionnaire by the researcher to get the student to both specify and summarise in one sentence his or her lived experience. After selecting the item that speaks most to him, the student evokes the emotional support provided by the teacher.""

Nevertheless, this is again an illustration of the method with a small part of the results of the thesis for the purpose of understanding.

Comment #4

Third, the writing style of the manuscript would need an English review and correct a lot of typos throughout the paper. What is more, authors should guarantee the blind review of the paper, so they should not cite themselves in first person.

We had the document proofread and corrected by a professional native translator. We had removed all the first-person citation for the expertise.

Comment #5

I would recommend the authors to do a new analysis of qualitative data and re-write the paper focusing on the second part of the study, what would enable the paper to go deeper into the interpretation of the qualitative findings of the study.

As you suggested, we have taken the article back to clarify and deepen the results for better overall coherence.

We reworked all our results to present deeper interpretation.

P15-16 "The results obtained through our mixed method research enable us to understand how students perceive and experience teacher support in order to engage in their work."

The quantitative results have been reworked. As suggested, we kept the analysis of the average scores obtained by the students. This was done in order to identify the frequency and importance of the perceived support of the students and to be able to select the students with a high perception throughout the year. However, we reworked the statistical analysis of variance in order to show not that there was a change in the perception of the teacher's social support but that there were variations in this perception between two teaching sequences.

P19 "This quantitative overview gives a global view of the support perceived by the students, and also shows some variability between the three periods. Beyond this snapshot, we thought it would be interesting to carry out a complementary qualitative analysis to understand how this perceived support helps them to engage in the school work required.

In order to refine the understanding of the meanings given to the teacher's social support during the teaching sequences, we chose, by calculating the differences in score between two teaching sequences, to identify the differences in perception of the teacher's support between students who have a high score of perception of the teacher's social support and those whose perception of support increases ("high score")."

The qualitative results were completely reworked to present only the characteristics of the 4 typical supports experienced by the students studied:

- Typical support coupled with teacher praise demonstrating progress promoting engagement in work

- Typical support coupled with the student's concerns in action promoting engagement in work

- Typical support coupled with teacher's play actions promoting engagement in work

- Typical support coupled with a repertoire of knowledge about the teacher's activity promoting engagement in work

P19 *"The analysis of the lived experience of the 24 students interviewed shows that the perception of typical support is coupled with the teacher's valuing of students, students' concerns, the teacher's play actions and a repertoire of knowledge about the teacher's activity."*

Thank you for your careful expert appraisal.